National Overview of the Municipal Separate Storm Sewer System (MS4) Program: Status and Progress

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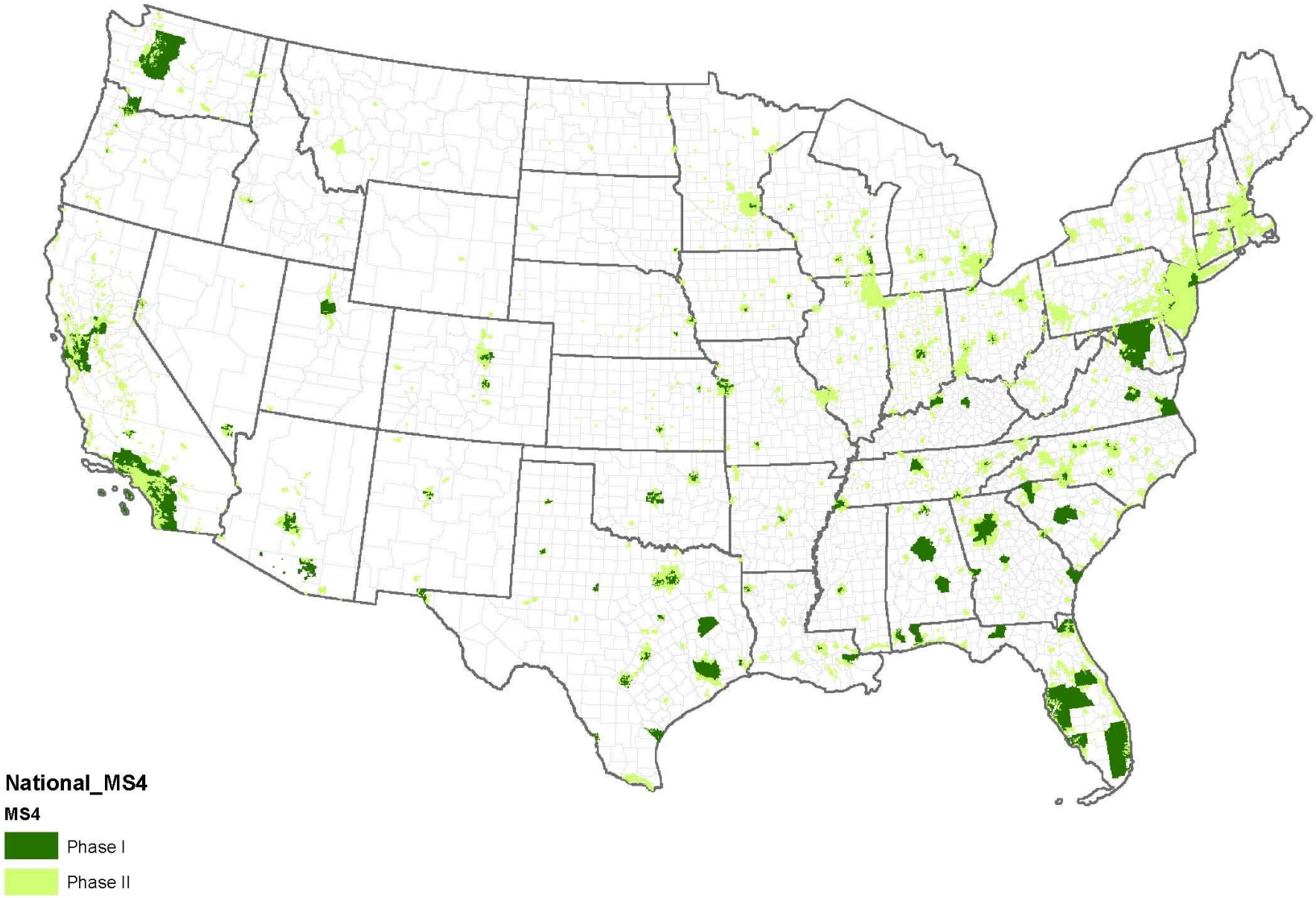
Today's Discussion

- Provide an overview of the status of the MS4 program based on data collected by EPA through its stormwater Information Collection Request (ICR) completed Fall 2010
  - Summary of MS4 permits
  - How MS4s are implementing the components of the stormwater program
    - Post-Construction Stormwater Management in New Development and Redevelopment
    - Public Education and Outreach
    - Illicit Discharge Detection and Elimination
    - Pollution Prevention/Good Housekeeping for Municipal Operations
    - Construction Site Runoff Control
    - Industrial
    - Monitoring

National Map of Current MS4 Program



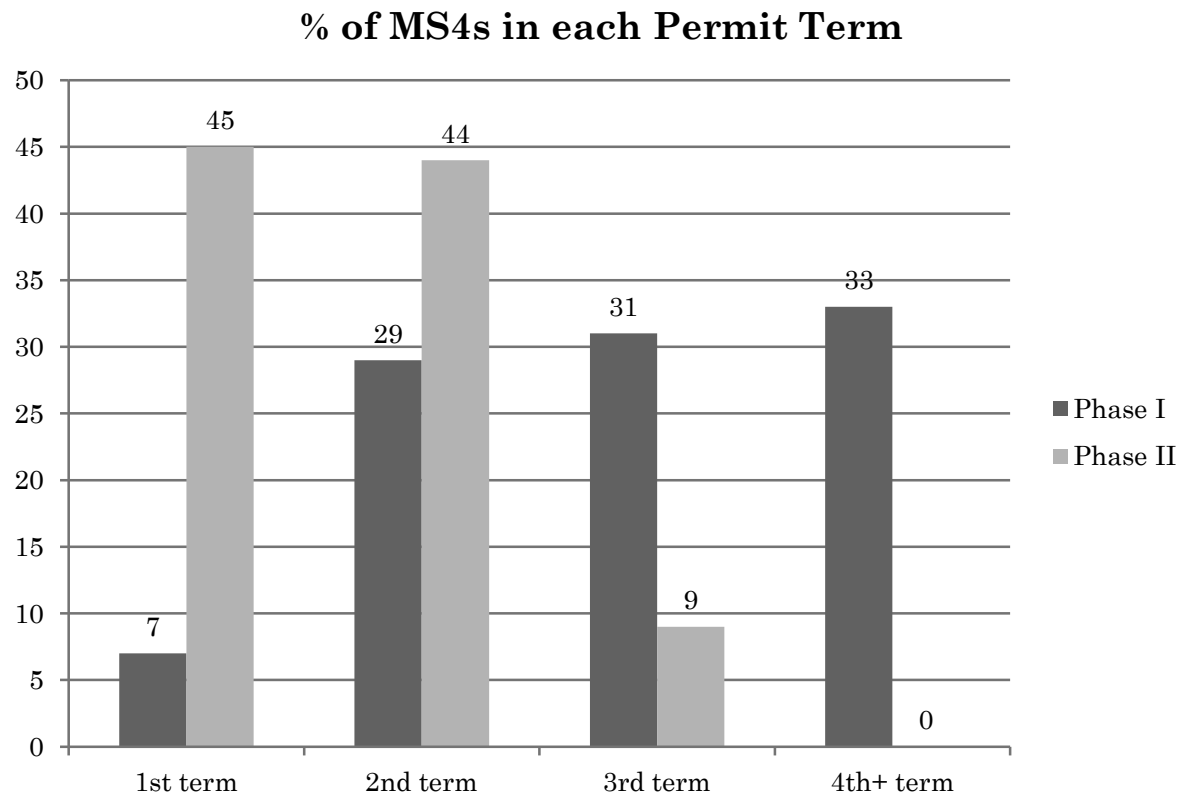
Currently, about 750 Phase I and 6,600 Phase II regulated MS4s

Who received the ICR?

- EPA sent separate ICR questionnaires to statistical sample of regulated and non-regulated MS4s:
  - 608 Regulated MS4s (77% response rate)
    - Responses from Phase I MS4s (53%) and Phase II MS4s (47%)
  - 932 Non-Regulated MS4s (32% response rate)
- Questionnaire sent to 84 Transportation MS4s (100% response rate)
- EPA also sent a questionnaire to each of the NPDES permitting authorities (generally the state environmental agency)
- Responses to the questionnaires are being used by EPA to assess current stormwater practices and requirements and characterize costs associated with controlling stormwater discharges

MS4 Permit Term

- Some of the first Phase I MS4 permits were issued in the early 1990s and have been reissued several times
- Phase II MS4 permits were first issued in 2003, however 45% are still covered by first permit
- Permit terms are 5 years, however many permits have been administratively extended



Geographical Boundaries of MS4 Permits

- Under the Phase II program, the regulated permitted area, at minimum, is defined as the urbanized area boundary as set by the Census, therefore, the MS4 permitted area could cover only a portion of the city or county
  - 28% Phase II MS4s - MS4 permitted area based on UA
  - 61% Phase II MS4s - MS4 permitted area based on jurisdictional boundary
- 14 states require the entire city to be covered under Phase II if only a portion of the city is in the urbanized area (NJ, NY, KY, NC, IN, WI, MN, IA, MO, CO, ND, SD, OR and WA)
- In cases in which the MS4 regulated area is less than the jurisdictional area, 30-40% of MS4s indicated that they implement their stormwater program activities in the entire jurisdiction including public education, IDDE, street sweeping, and post-construction controls

POST-CONSTRUCTION PROGRAMS

- Many states and MS4s have improved their program to reduce stormwater discharges from new development and redevelopment, and have addressed retrofits
  - Post construction performance standard for new and redevelopment
  - Drivers, incentives & barriers of green infrastructure
  - Implementation: legal authority, site plan review, tracking, inspections, enforcement
  - Public vs. Private property
  - Retrofits

Post Construction Performance Standards

- 21 states - narrative program requirement
- 29 states plus DC - performance standard to retain or treat some volume of stormwater
  - Standards
    - 18 states and DC have specific retention standards to infiltrate, evapotranspire, or harvest and use the water quality volume
    - 11 states have a treatment only standard to reduce pollutant concentrations
  - Size threshold: 8 states apply their standards to sites less than one acre; remaining states use one acre threshold
  - Statewide
    - 10 states apply their standard statewide (6 states have statewide standards for sites less than one acre)
    - 2 states apply their standard to certain regions of the state (MA – wetland areas; NC – coastal counties) that are also applied to sites less than one acre

http://epa.gov/npdes/stormwater/rulemaking/performancestandards.cfm

Post Construction Performance Standards

- Alternative compliance mechanisms

	Phase I	Phase II
Waiver process	23%	14%
Appeal process	14%	7%
Stormwater mitigation program	10%	2%
Payment in lieu program	11%	2%
Another type of alternative compliance program	10%	3%
Other level of government offers an alternative program	4%	2%
Alternative compliance program does not exist	32%	43%

- Basis for allowing alternative to compliance

	Phase I	Phase II
Infiltration cannot be achieved: lot size too small outside of the footprint to create the necessary infiltration capacity (even with amended soils), shallow groundwater or other infiltration issues	22%	10%
Soil instability as documented by geotechnical analysis	17%	7%
Capture or reuse of stormwater cannot be achieved on the property	16%	7%
Cost constraints	8%	2%
Other	28%	14%
An alternative compliance program does not exist	39%	43%

Post Construction Performance Standards

- Compliance mechanisms
  - 67% MS4s - site inspections during construction
  - 57% MS4s - site inspections after construction
  - 71% MS4s - site plan review, approval and acceptance
  - 17% MS4s - review of self-reporting and self-certification databases
- Post construction activities

	Phase I	Phase II
Review construction site plans for post-construction stormwater water quality requirements	76%	64%
Review construction site plans for post-construction stormwater water quantity requirements	68%	68%
Tracking/inventory of sites and/or post-construction stormwater management controls on those sites	67%	44%
Inspections of post-construction stormwater management controls	75%	66%
Maintenance of post-construction stormwater management controls	56%	42%
Training of field inspections staff	71%	43%
Contractor training	32%	19%
Other	19%	13%
None	7%	13%

Post Construction Performance Standards

- Public vs. private property
  - MS4 authority
    - Most MS4s have authority to inspect controls on private property and compel private owners to operate and maintain controls on their private property (74% of Phase I and 63% of Phase II MS4s)
    - Few MS4s have authority to operate and maintain controls on private property (22% of Phase I and 19% of Phase II MS4s)
    - 76% of Phase I and 59% of Phase II MS4s have the legal authority to include maintenance obligations or rights of inspection in recorded covenants, deeds, conditions and restrictions or equivalent documents that are binding on privately owned properties
  - MS4 implementation

	Controls on Public Property		Controls on Private Property	
	Phase I	Phase II	Phase I	Phase II
Track	80%	53%	61%	41%
Inspect	88%	69%	51%	48%
Maintain	84%	68%	7%	5%

83% of Phase I and 74% of Phase II MS4s require private homeowners to maintain controls on their property through an ordinance of other regulatory mechanism

Drivers & Incentives of Green Infrastructure

	Phase I	Phase II
Stormwater Management Requirement	55%	45%
CSO Long Term Control Plan Requirement	5%	4%
To address flooding	27%	33%
TMDL or other water quality requirement	25%	15%
Safe Drinking Water Act Requirement	4%	7%
Other federal regulation requirement	5%	6%
Other	21%	20%
Unknown	4%	14%
Not applicable	16%	12%

Regulatory barriers to green infrastructure

	Phase I	Phase II
Specific Water Requirements		
Standing water restrictions which may prevent the use of extended detention, water reuse or other practices.	41%	17%
Water rights issues which may prevent water harvesting or reuse (rain barrels, cisterns)	12%	5%
Water rights issues which may prevent stormwater infiltration	10%	3%
Restrictions related to groundwater contamination potential	44%	25%
Restrictions related to sole source aquifer limitations	6%	5%
Restrictions on tree/wetland protection requirements	20%	16%
Site Design/Infrastructure Practices		
Curb and gutter requirements which may restrict roadside infiltrations practices	56%	50%
Maximum/minimum parking lot size requirements	55%	56%
Maximum/minimum roadway widths	64%	63%
Requirements setting minimum/maximum cul-de-sac radius	57%	56%
Restrictions on the width of rights-of-way	50%	41%
Setbacks from public or private infrastructure	48%	41%
Conflicts in obtaining private land (e.g., for use as a public right-of-way)	44%	28%

Regulatory barriers to green infrastructure

	Phase I	Phase II
Restrictions on setbacks/frontages	53%	48%
Restrictions related to plumbing codes (e.g., prohibitions on stormwater reuse for toilet flushing)	46%	23%
Vegetation Requirements		
Restriction on height of vegetation (e.g., wetland vegetation or grasses)	29%	26%
Restriction related to tree placement (e.g., restricting the places where trees may be planted, such as near sidewalks, utility poles, along certain stretches of roads)	47%	33%
Aesthetic requirements for plantings	30%	17%
Other Requirements		
Requirements that may restrict the use of pervious concrete, porous asphalt, modular block pavers, or other alternatives to conventional/impermeable paving materials	31%	13%
Limited mixed use/compact development	16%	14%
Restrictions related to deeds	9%	5%
Restrictions on stormwater reuse for irrigation (e.g., health code restrictions)	22%	6%

Barriers to green infrastructure

- About half (53%) of all MS4s reported having maintenance concerns that may prevent stormwater retention practices from being implemented in their jurisdiction

- 45% of Phase I MS4s and 19% of Phase II MS4s have categories or areas excluded from stormwater infiltration due to concerns for groundwater contamination or mobilization of contaminated sediments

Programs that support green infrastructure

	Phase I	Phase II
Open space program or requirements	68%	51%
Urban growth boundaries	33%	20%
Natural resource area protection	59%	41%
Reduce lot/parcel size requirements	22%	18%
Reduce street width requirements	16%	11%
Stream restoration/remediation program	31%	20%
Incentives for infill/redevelopment	37%	8%
Incentives for Brownfield development	26%	8%
Incentives for mixed use	33%	14%
Enterprise communities or empowerment zones	22%	9%
Buffer/riparian corridor requirements	44%	39%
Restrictions on the amount of impervious surfaces (e.g., caps on the amount of impervious surfaces)	33%	35%

Parking lot requirements

	Phase I	Phase II
Reduced parking lot size requirements	13%	5%
Pervious material requirements	13%	4%
Design standards that require retention practices such as rain gardens, infiltration islands, or others	25%	11%
Design standards that require curb cuts or other flow requirements	17%	15%
Other	26%	13%
No	45%	65%

Incentives for green infrastructure

	Phase I	Phase II
Reduced stormwater utility fees	10%	8%
Development incentives: (e.g., zoning upgrades, expedited permitting, reduced stormwater requirements, increases in floor area ratios, etc.)	8%	4%
Reduction in the volume of stormwater required to be managed	10%	9%
Grants: Provide direct funding to property owners and/or community groups for implementing a range of green infrastructure projects and practices	3%	4%
Rebates & installation financing: (e.g., provide funding, tax credits or reimbursements to property owners who install specific practices)	2%	1%
Awards & recognition programs (e.g., provide marketing opportunities and public outreach for exemplary projects)	6%	4%
Other	8%	3%
None	57%	66%
Unknown	5%	5%
Not Applicable	7%	3%

Retrofits

- 41% of Phase I and 18% of Phase II MS4s have a stormwater retrofit program
- 60% of Phase I and 39% of Phase II MS4s have initiated or completed a retrofit project

Purpose of Retrofit Program	Phase I	Phase II
To comply with stormwater permit requirements	26%	9%
As a demonstration site or training opportunity	14%	5%
To comply with CSO long term control plan	3%	1%
To address flooding	23%	12%
To address wetlands mitigation	10%	2%
To comply with Total Maximum Daily Load (TMDL) or other Clean Water Act water quality requirement(s)	20%	7%
To comply with Safe Drinking Water Act (SDWA) wellhead protection or UIC regulations	4%	1%
To comply with other federal regulations (ESA, CERCLA, WRDA, etc.)	5%	1%
Other requirements, such as state requirements	4%	1%
To address watershed plan or local water quality, habitat or stream stability or geomorphology concerns	22%	10%
Other	7%	0%
Not applicable	6%	9%

Public education and Outreach

	Phase I	Phase II
Brochures, fact sheets, guides, or similar documents	96%	90%
Radio features	44%	22%
Television advertisements or programs	56%	32%
Educational programs (for the general public, school children, teachers, etc.)	85%	67%
Event participation (conference participation, earth day events, fairs, etc.)	90%	73%
Staff training	93%	80%
Contractor training	61%	34%
Storm drain labeling (stenciling or marking)	86%	65%
Stormwater hotlines	69%	35%
Direct mail	57%	45%
Surveys	52%	23%
Tributary signage	27%	16%
Watershed or floodway signage	31%	14%
Website	82%	77%
Car washing public program	25%	9%

Illicit discharge detection & elimination program

- 83% of Phase I and 77% of Phase II MS4s have storm sewer system mapping
- 55% MS4s have databases or paper tracking/ inventories of outfalls
- Number of outfalls
  - 37% MS4s have less than 100 outfalls in their MS4 service area.
  - 19% MS4s have 101 – 500 outfalls in their MS4s service area
  - 28% MS4s number of outfalls were unknown
- 75% Phase I and 72% Phase II MS4s perform outfall inspections
- 78% Phase I and 50% Phase II MS4s have a public reporting method (e.g. hotline)

Pollution prevention/Good housekeeping

Activity	Phase I	Phase II
Inventory of municipal facilities	79%	65%
Municipal facility assessment (to determine the facility's potential to discharge pollutants)	70%	55%
Outdoor vehicle washing	69%	40%
Outdoor fueling operations	71%	42%
Outdoor vehicle maintenance	59%	32%
Outdoor de-icing/anti-icing material storage	26%	38%
Periodic municipal facility inspections for stormwater controls	78%	53%
Storm sewer system maintenance activities (includes inspections and cleaning)	93%	79%
Street sweeping activities	90%	77%
Pesticide/herbicide application and management requirements	74%	35%
Fertilizer application and management requirements	56%	28%
Pet waste cleanup or collection ordinance or other regulatory requirements	50%	34%
Turf management requirements	23%	9%
Field staff pollution prevention training	80%	57%
Contractor pollution prevention training	47%	17%

Fertilizer, detergent and pesticide limits on sale and usage

	Number of Phase I MS4s	Number of Phase II MS4s
Nitrogen Fertilizer		
Prohibit sale	2	0
Prohibit usage	5	3
Limit usage	19	7
Phosphorus Fertilizer		
Prohibit sale	3	6
Prohibit usage	11	13
Limit usage	22	8
Phosphorus Detergent		
Prohibit sale	9	5
Prohibit usage	2	5
Limit usage	13	3
Pesticides		
Prohibit sale	8	1
Prohibit usage	10	2
Limit usage	14	7

Construction Program

	Phase I	Phase II
Review site plans	94%	93%
Tracking/ inventory of sites or stormwater management practices	75%	50%
Inspections	92%	83%
Field staff training	87%	58%
Contractor training	48%	31%
Enforcement	86%	64%
Complaint response	93%	75%
Other	15%	10%

Industrial Program

	Phase I	Phase II
Inventory of industrial facilities	73%	9%
Education of industrial operators about stormwater requirements and/or controls	59%	6%
Site inspection of industrial facilities	73%	14%
Site inspection of commercial facilities	69%	16%
Training of inspectors	69%	10%
Other	16%	11%
None	12%	66%

Monitoring Programs

	Phase I	Phase II
Stormwater outfall monitoring – dry weather (not including visual inspections as part of the IDDE program)	52%	33%
Stormwater outfall monitoring – wet weather	45%	19%
Stormwater monitoring of specific stormwater controls – dry weather	24%	10%
Stormwater monitoring of specific stormwater controls – wet weather	27%	14%
In-stream monitoring for water quality parameters	64%	20%
In-stream monitoring for biological parameters	45%	13%
In-stream monitoring for geomorphology or physical habitat	32%	6%
Other	25%	7%
No	10%	41%

Monitoring Programs

Does the MS4, or a partner organization, have data or modeling information indicating any chemical, biological, and/or physical changes in the receiving waters to which you discharge stormwater that you can attribute to implementation of your stormwater program?

	Phase I	Phase II
Yes	32%	6%
No	46%	71%
Unknown	17%	17%

Comments:

- "pollutant levels have roughly stayed the same while the population has increased by approx. 200,000 in the monitoring period"
- "decrease in metals in sediment from historical levels"
- "decreased diazinon following federal phase-out supported by stormwater program"
- "illicit discharges were eliminated"
- "noticed improved dry weather bacteria water quality at beaches downstream of treatment devices"
- "no remaining dry-weather flow, previously 0.5 CFS according to TMDLs"
- "fecal coliform reduction before vs. after IDDE, O&M and retrofit actions"
- "we have seen a reduction in turbidity and TSS since 2000"

Monitoring comments (continued)

- "significant reduction of pollutants discharged as a result of new development BMP implementation"
- "TSS data trends and narrative habitat assessments indicate reductions in siltation and sedimentation "
- "from 2005 to 2009 we have estimated load reduction for nitrogen, phosphorous, bacteria and TSS using the EPA model related to our construction inspection, street sweeping and outreach and education programs"
- "reduction of TSS has resulted in the delisting of that water body"
- "regional monitoring data may be used to indicate some trends, it is not possible to attribute any trends in receiving waters to the implementation of any specific storm water program"

Summary

- The results of this questionnaire of 471 regulated MS4s represents a unique summary of how MS4s nationwide are implementing the stormwater program requirements
- Many states have strengthened their MS4 programs to better protect water quality by advancing both where the program is applied and by adding specificity to stormwater program elements to improve implementation
- Some of highlights include:
  - Spatial Extent: 61% of Phase II MS4s have their entire jurisdiction covered by the stormwater program. In addition, 14 states require MS4s to implement the stormwater program jurisdiction-wide
  - Post-construction Program: most Phase I MS4s (80%) and Phase II MS4s (64%) implement a post-construction standard that includes either numeric or specific stormwater performance standards or design criteria for stormwater controls
  - There are high rates of implementation for many of the key activities such as public education and involvement, storm sewer system mapping and outfall inspections, and municipal maintenance
  - Many MS4s are implementing retrofit programs (41% of Phase I MS4s and 18% of Phase II MS4s). These programs are important to enhance the reduction of stormwater pollutants and discharge volume and rates of stormwater to receiving waters

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